



IMMUNE MECHANISM TO PROTECT THE HOST AGAINST PATHOGENS

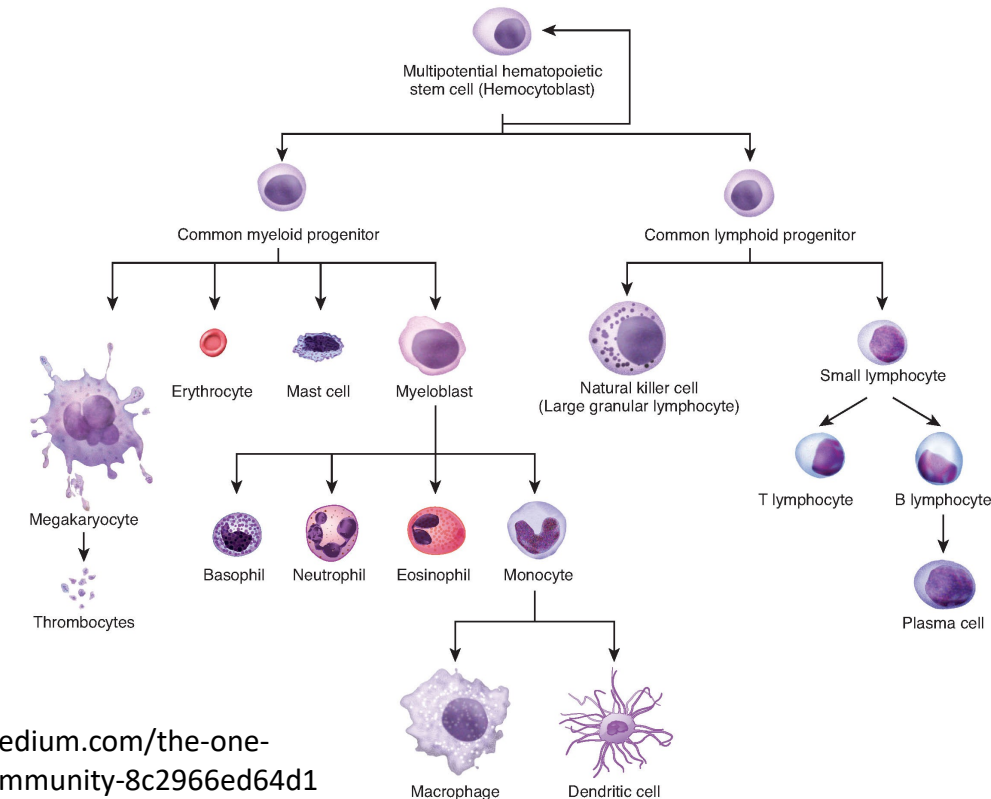


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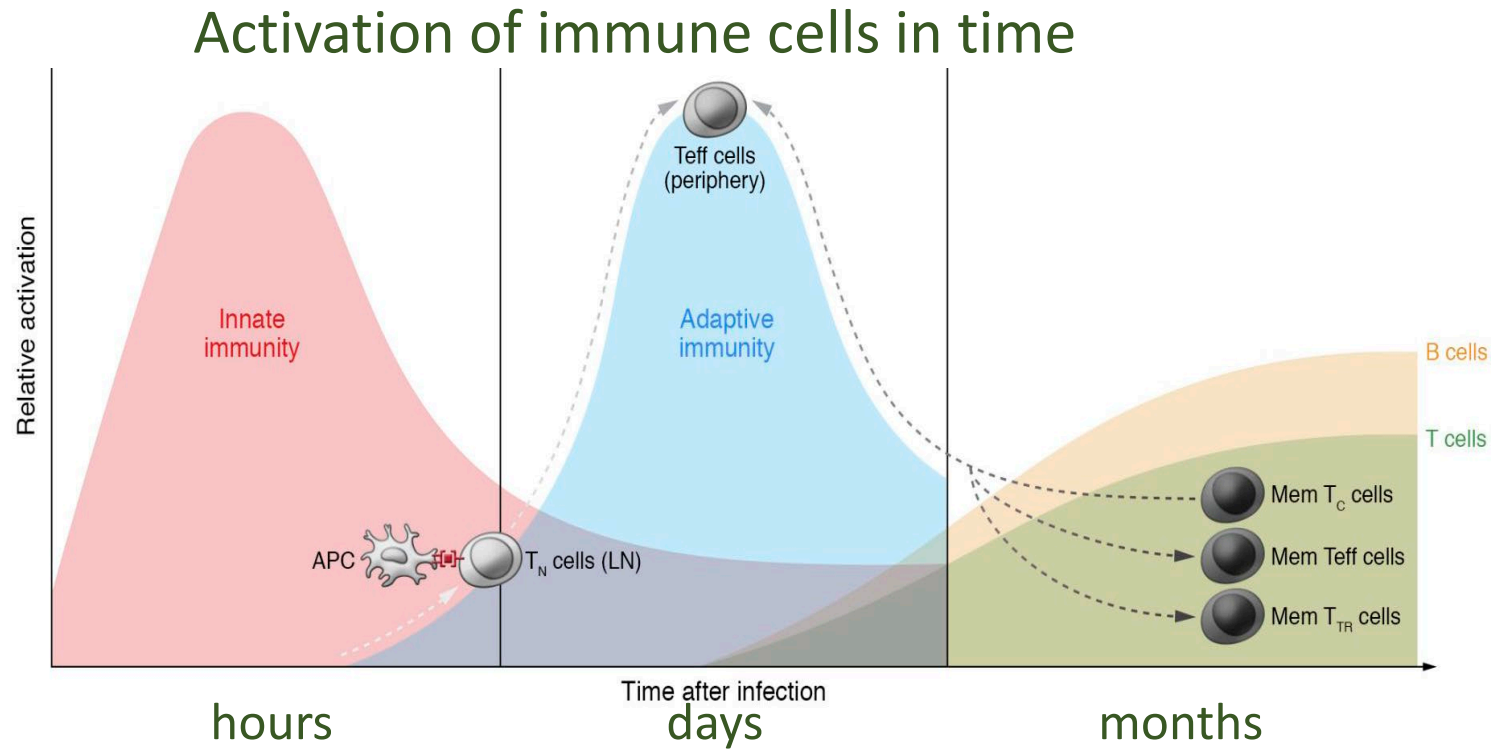


- Host defence, autotolerance, immune supervision of organism
- Goal – maintain the homeostasis and integrity of host
- Innate and adaptive arm of IS
- Humoral (complement, acute phase proteins)
- Cellular (activated cells)



<https://rashmi-singh1789.medium.com/the-one-about-innate-and-adaptive-immunity-8c2966ed64d1>

- Different dynamic of their activation and response



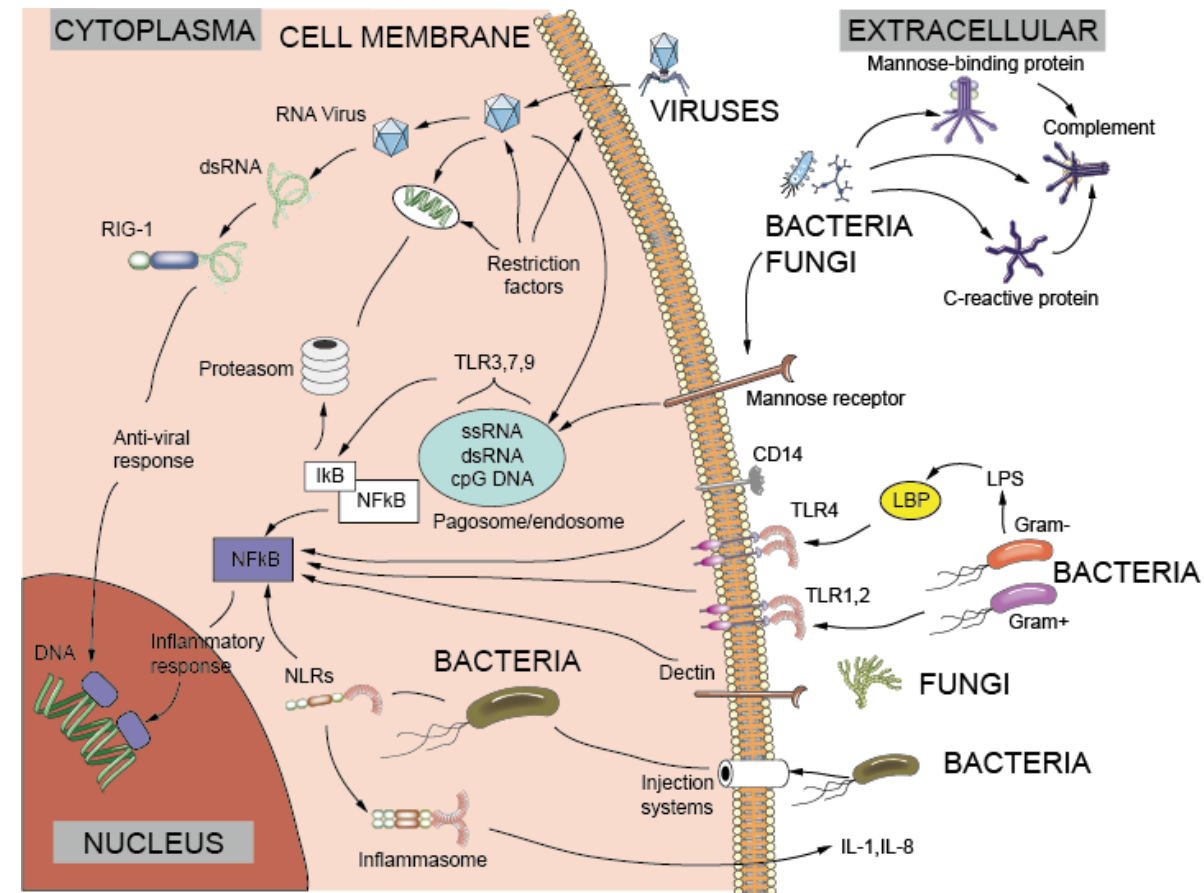
<https://manhattanbiosolutions.com/innate-immunity/>



Activation of immune system & induction of Inflammation

- Activation – through various extracellular and intracellular receptors
- Activatory molecules
 - Antigens-
 - PAMPs
 - DAMPs
 - Cytokines
- Induction intracellular cascades

=> **inflammation**



<https://www.creative-diagnostics.com/receptors-of-the-innate-immune-system.htm>



non-specific (fast)

specific (time demanding)

cellular

polymorphonuclears,
monocytes, macrophages,
DC, NK cells

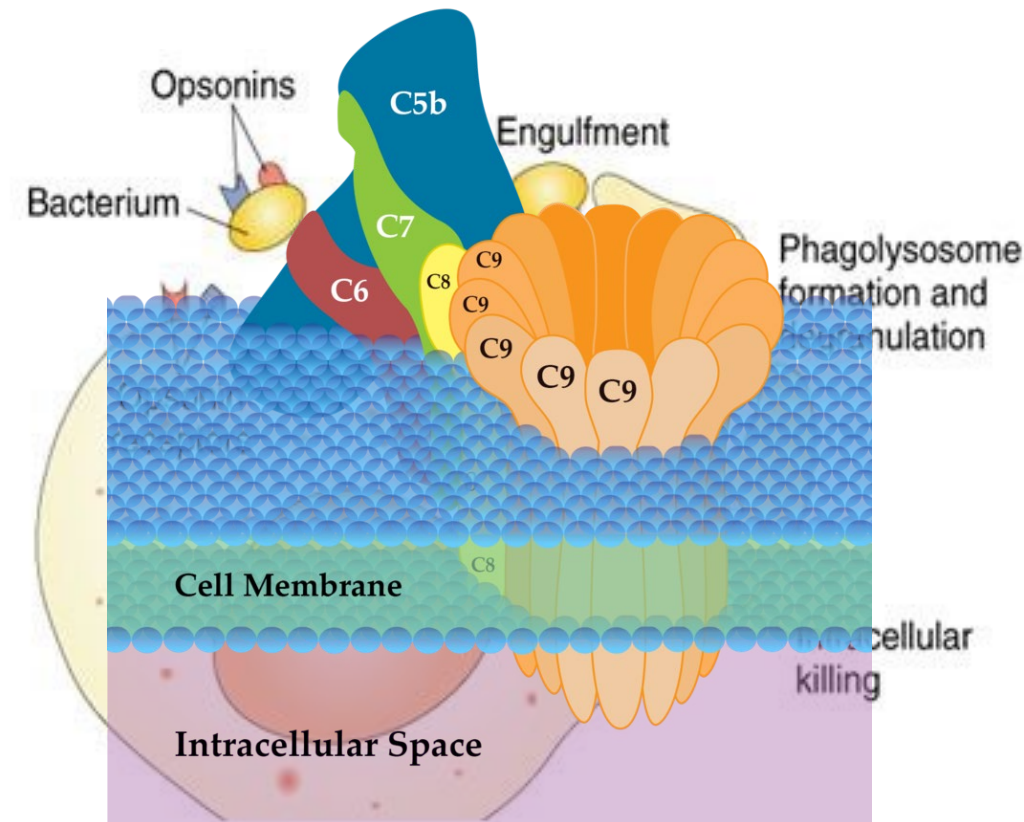
T cells

humoral

complement,
acute phase proteins
(CRP, PCT..)

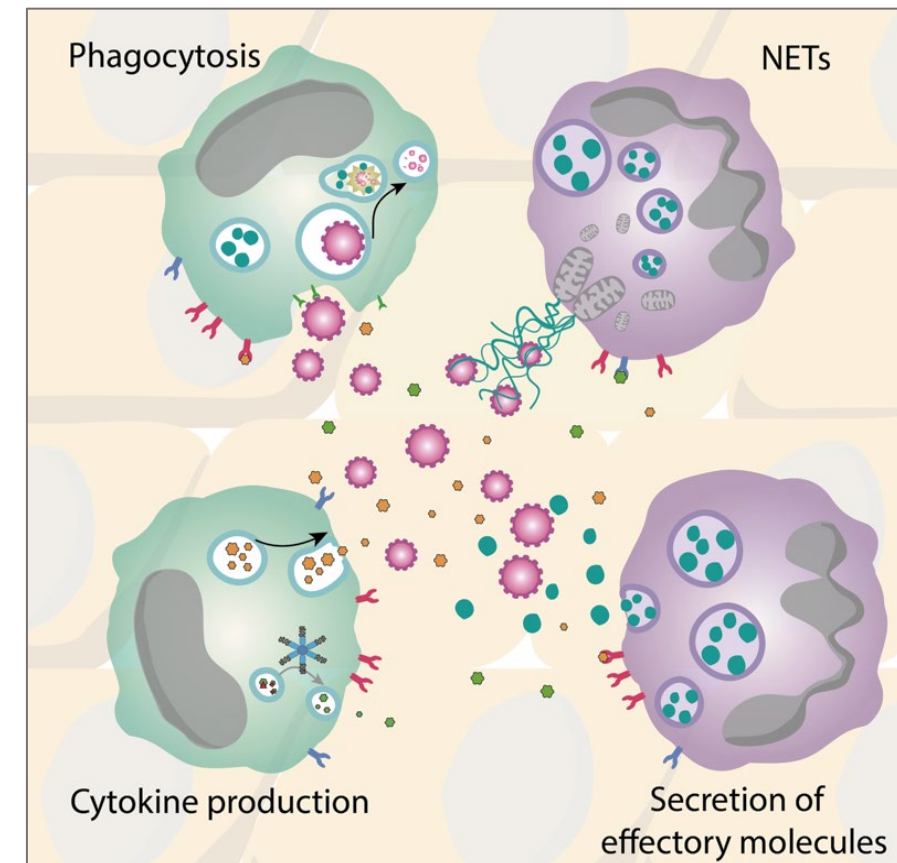
specific antibodies
(B cells)

- Humoral components – serve as opsonins
 - Acute phase proteins (CRP, PCT)
 - Expression induced by cytokines (IL-6, TNF α)
 - For opsonization of pathogens (not specific)
- Complement
 - Classic, alternative and lectin activation
 - Chemotaxis, opsonization

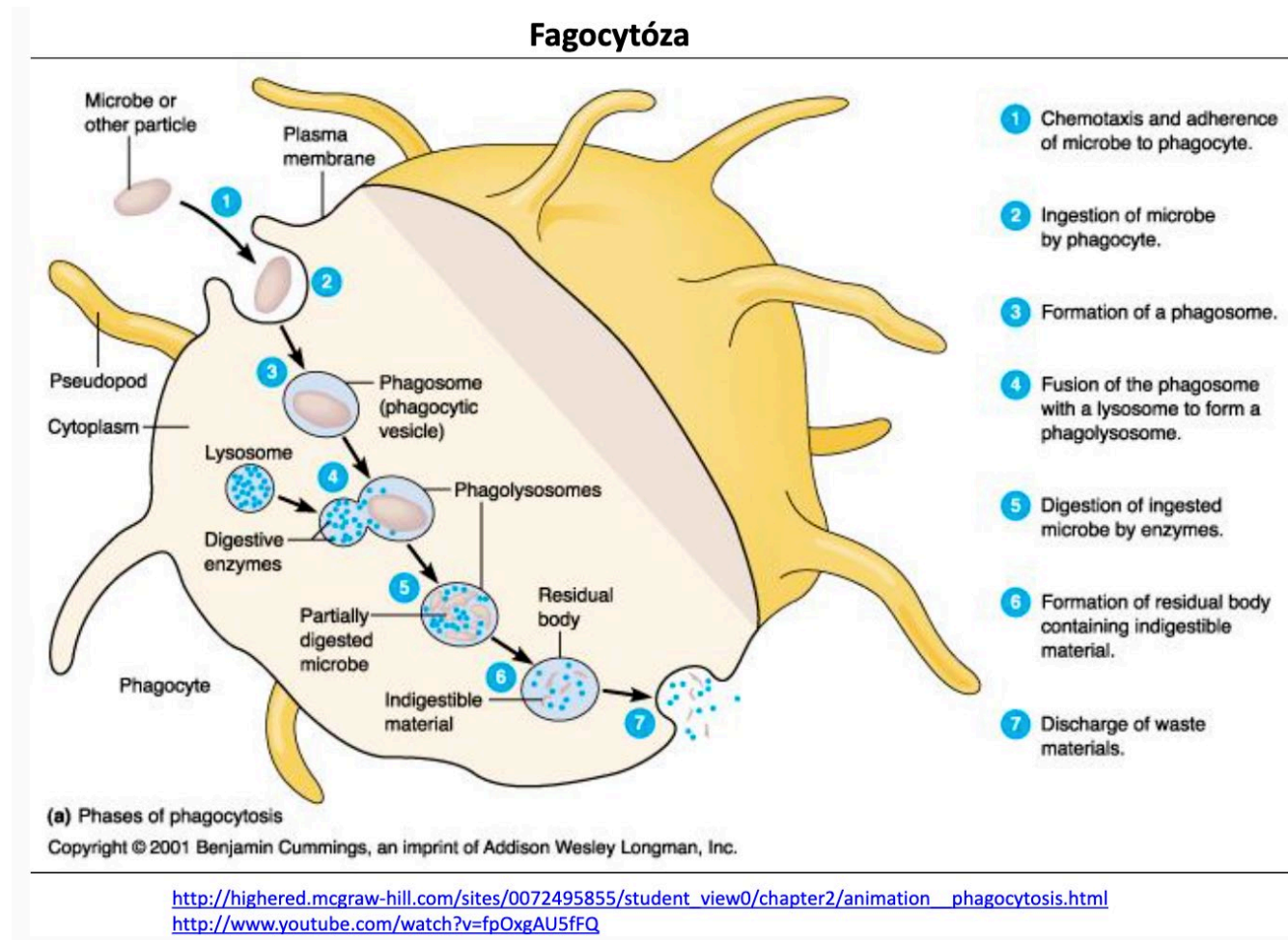


<https://quizlet.com/46166263/immuno-complement-flash-cards/>

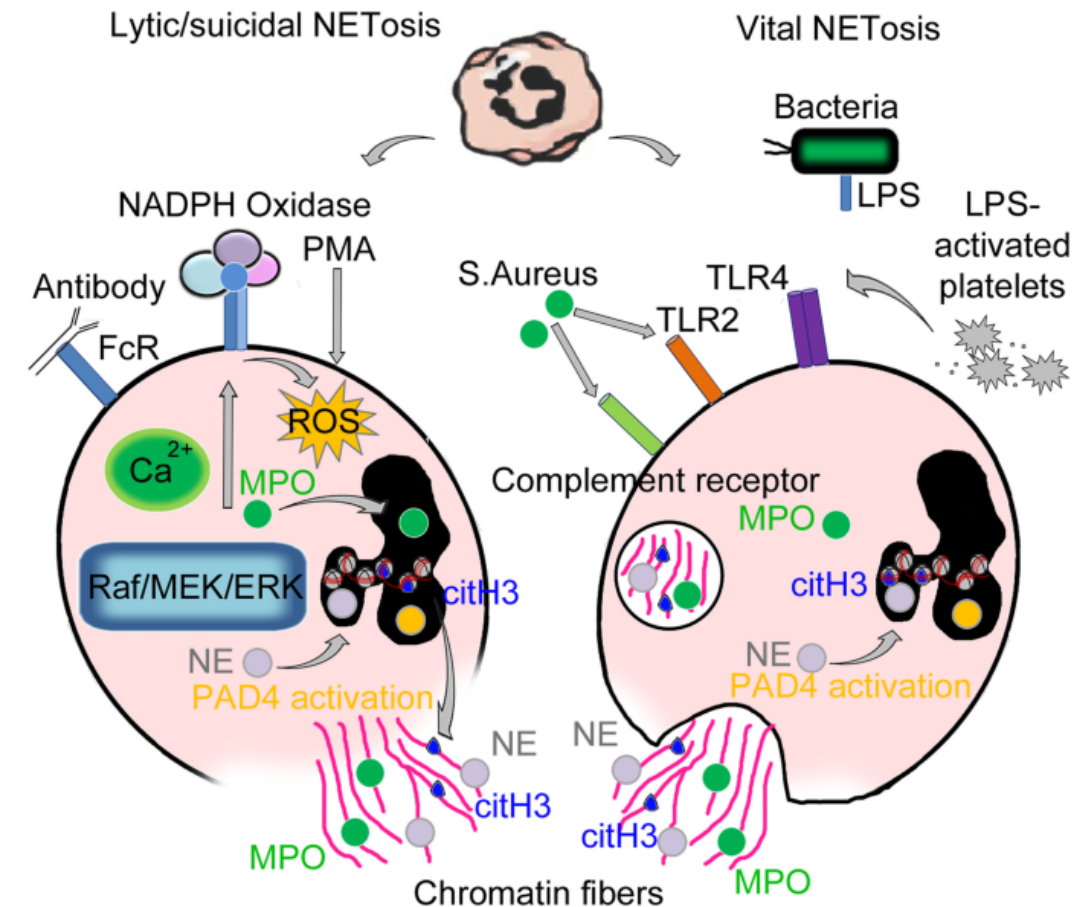
- Cellular mechanisms for pathogen removal
 - **Phagocytosis** & microbicidal systems
 - **NETs** (neutrophil extracellular traps)
 - **Cytokine** production – cell communication, synchronization of immune response
 - **Erythrocyte lysis** – pathogens in blood stream



- Phago activation –
 - Pathogen binding to receptors
 - Fc, Dectin, MARCO, CD36, TLR
- Internalization
- Pathogen elimination
 - Oxidative burst
 - Defensins, lysosyme (pH)

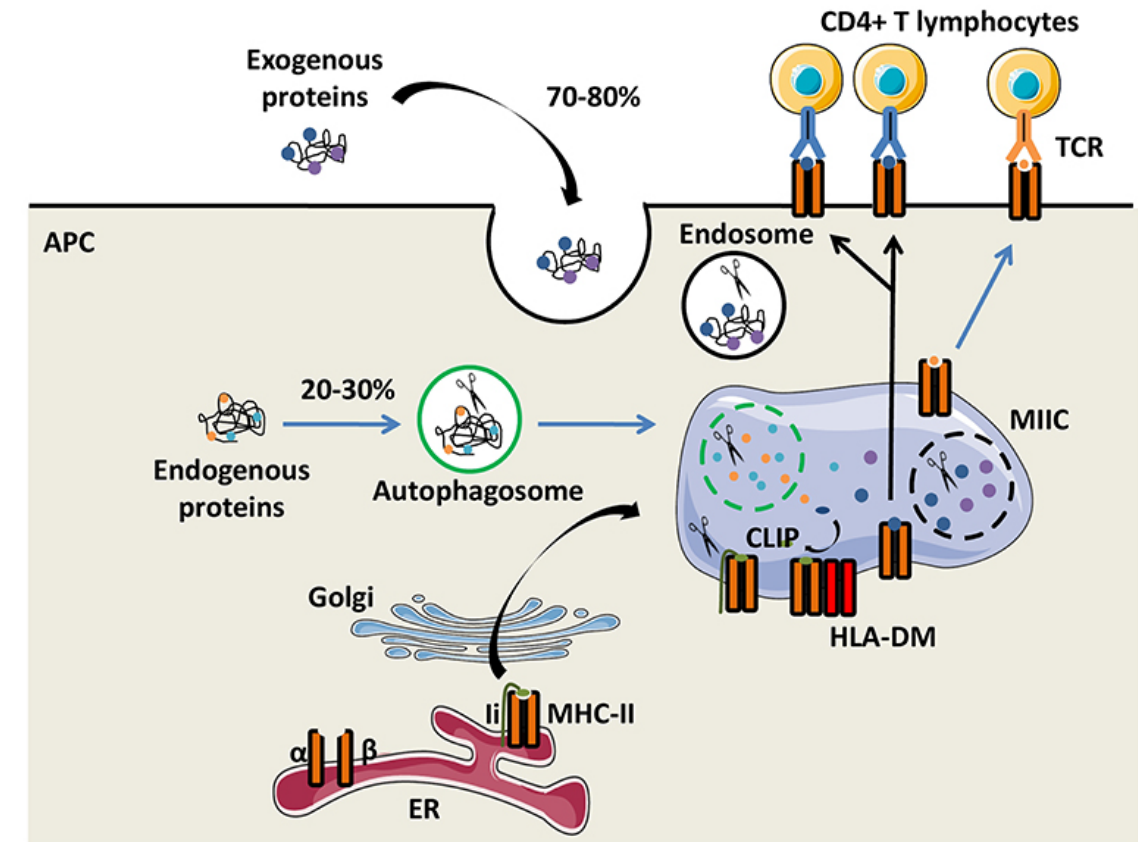


- **NETs** – for larger pathogens, which cannot be phagocytosed
 - Fibres from DNA with histones and effector proteins (MPO)



<https://doi.org/10.1186/s13046-021-02036-z>

- Activation of adaptive immunity
 - Monocytes, MF & DC
 - Through MHC receptors
- Induction:
 - specific antibodies for opsonization (B cells)
 - T cell specific immunity



<https://doi.org/10.3389/fimmu.2019.01081>

- Innate immunity is faster, reactions in minutes and hours
- Activation of innate immune cells lead to production of systemic markers (CRP, PCT)
- Processes for pathogen elimination are dysregulated during sepsis

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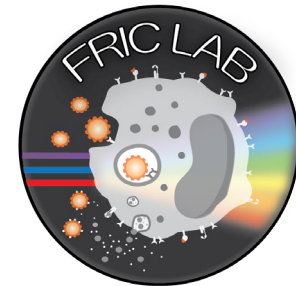
THANK YOU FOR YOUR ATTENTION!

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